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Critical temperature of inhomogeneous magnetic superconductor: Effective tensor field approach

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Abstract

© Published under licence by IOP Publishing Ltd. Superconducting state with The inhomogeneous effective exchange field background is studied. We calculate The critical temperature of magnetic superconductor on The basis of The Hamiltonian that takes into account The interaction of electrons with The effective exchange field in The direction of inhomogeneity. We use The local unitary rotation in spinor space to rewrite The Hamiltonian in The new basis, where this interaction is diagonal. In this case The exchange field becomes homogeneous but The effective tensor field appears. This method allows us to simplify The Gor'kov equations in many symmetric cases and to find The Green's functions and The critical temperature. We test our approach on The known case of magnetic superconductor with helical magnetization and focus on The critical temperature and The Fulde- Ferrell-Larkin-Ovchinnikov (FFLO) states.

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